

Patent Application No. 09/995,205  
Attorney Docket No. 81716.0081

REMARKS:

Claims 1 and 4 are amended. Claims 1-17 are pending in the application. No new matter is added. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The present invention relates to a non-radiative dielectric waveguide used in a high-frequency band, such as a millimeter wave band, and more particularly to a non-radiative dielectric waveguide suitably used for a millimeter wave integrated circuit or the like. The invention also relates to a millimeter wave transmitting/receiving apparatus of non-radiative dielectric waveguide type, such as a millimeter wave integrated circuit or a millimeter wave radar module. (Applicants' specification, at p. 1, first paragraph).

CLAIM REJECTIONS UNDER 35 U.S.C § 103:

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanizaki et al. (U.S. Patent No. 5,982,255). Applicant respectfully traverses these rejections. Claim 1, as amended, is as follows:

A non-radiative dielectric waveguide comprising:

a pair of parallel planar conductors arranged at an interval of half or below of a high-frequency signal wavelength; and

a dielectric strip interposed between the parallel planar conductors, the dielectric strip having a 0.01 to 0.3 mm-wide chamfer formed at an edge portion in a transmission direction of the dielectric strip;

wherein a surface of each parallel planar conductor adjacent to the dielectric strip is planar.

Claim 1 was amended to clarify that the present invention requires "a pair of parallel planar conductors ...wherein a surface of each parallel planar conductor adjacent to the dielectric strip is planar." Present claim 1 prevents adhesive 4 from exhibiting a large dielectric loss in the vicinity of a center portion of a side surface

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2b of the dielectric strip 2, onto which electric fields are concentrated. Thus, it is possible i) to prevent transmission loss in high-frequency signals from becoming large because of the attenuation of high-frequency signals due to the adhesive 4 and ii) to maintain high adhesion strength in the dielectric strip 2. (Applicants' specification, at p. 17-19 and Figure 6A). In other words, since a meniscus of the adhesive 4 is formed at a lower end of the side surface 2b of the dielectric strip 2 (Figure 6A), it is possible to enhance the adhesion strength in the dielectric strip.

In Tanizaki, grooves are formed in metallic flat surfaces, and "the corners of the dielectric strip 15 are chamfered in conformity with the tapers of the walls of the grooves formed in the metallic flat surfaces 9 and 10" (Tanizaki, column 8, lines 59-61). Consequently, the surfaces of the conductors adjacent to the dielectric strip are not planar, but instead have indentations. These non planar surfaces are clearly shown in Figures 17A and 17B (Tanizaki). Accordingly, Tanizaki does not teach or suggest "a pair of parallel planar conductors ... wherein a surface of each parallel planar conductor adjacent to the dielectric strip is planar." Thus, in Tanizaki's fitting of the dielectric strip into a groove, in contrast to the present invention, the meniscus of the adhesive is not formed at the lower end of the side surface of the dielectric strip, and the adhesive is present in the vicinity of the center portion of the side surface of the dielectric strip, onto which electric fields are concentrated, with the result that transmission loss in high-frequency signals easily occurs.

In addition, as the Office admits, Tanizaki does not teach a "dielectric strip having a 0.01 to 0.3 mm-wide chamfer formed at an edge portion in a transmission direction of the dielectric strip." However, the Office alleges that one skilled in the art "would have it obvious for the chamfer to be 0.01 to .3 mm wide and for the chamfer to have a convexly curved surface in for the dielectric strip to conform to the grooves in the conductive plates." However, in the present invention, there are no grooves in the conductive plates to which the corners of the dielectric strip need to be chamfered, and consequently, one of ordinary skill in the art would not have

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been motivated to use a dielectric strip having any chamfer, much less a 0.01 to 0.3 mm-wide chamfer. Furthermore, the selection of a dielectric strip having a 0.01 to 0.3 mm-wide chamfer in the present invention was based upon optimizing adhesion strength while minimizing dielectric loss. (Applicants' specification, at p. 17-19). The use of chamfers in Tanizaki, however, was to "facilitate fitting the dielectric strip into grooves formed in the metallic flat plates, while securing the dielectric waveguide against any positional offset" (Tanizaki, column 8, lines 62-65).

In light of the foregoing, Applicants respectfully submit that Tanizaki could not have made claim 1 obvious. Withdrawal of this rejection is thus respectfully requested.

Claims 2 and 3 depend from claim 1 and cannot be made obvious for the same reasons as claim 1. In addition, Tanizaki does not disclose the feature of claims 2 and 3 that "one width of the chamfer corresponding to a surface of the dielectric strip facing to the parallel planar conductor is made larger than the other width corresponding to a side surface of the dielectric strip." Withdrawal of this rejection for this reason and the reasons discussed above is respectfully requested.

Claims 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanizaki et al. (U.S. Patent No. 5,982,255) in view of Fujimaru et al. (U.S. Patent No. 5,246,898). Applicant respectfully traverses these rejections. Claim 4, as amended, is as follows:

A non-radiative dielectric waveguide comprising:

a pair of parallel planar conductors arranged at an interval of half or below of a high-frequency signal wavelength; and

a dielectric strip interposed between planar surfaces of the parallel planar conductors, the dielectric strip being made of a ceramics having an open pore ratio of 5 % or less;

wherein a surface of each parallel planar conductor adjacent to the dielectric strip is planar.

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As discussed above, Tanizaki does not teach or suggest "a pair a of parallel planar conductors ...wherein a surface of each parallel planar conductor adjacent to the dielectric strip is planar." Fujimaru cannot remedy the defect of Tanizaki and is not relied upon for the Office for such. Instead, the Office cites Fujimaru for teaching "a ceramic having open pore ratio being 7% or less." Therefore, the combination of Tanizaki and Fujimara cannot render the claimed invention obvious.

Claim 5 depends from claim 4 and cannot be made obvious for at least the same reasons as claim 4. Withdrawal of these rejections is thus respectfully requested.

Claims 6-8 and 11-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanizaki et al. (U.S. Patent No. 5,982,255) in view of Kii et al. (U.S. Patent No. 6,437,663). Applicant respectfully traverses these rejections.

Claims 6-8 and 11-13 depend from claim 1, and as such are patentable over Tanizaki for at least the same reasons as claim 1. In addition, claims 7 and 12, and claims 8 and 13, depend from claims 2 and 3, respectively, and as such are patentable over Tanizaki for at least the same reasons as claims 2 and 3. Kii cannot remedy the defect of Tanizaki and is not relied upon for the Office for such. Instead, the Office cites Kii for teaching a ceramic that includes "a complex oxide comprising Mg, Al and Si as a main component and having a Q value of 1000 or above at a measured frequency of 60GHz." Therefore, the combination of Tanizaki and Kii cannot render the claimed invention obvious.

In addition, Applicants respectfully submit that under 35 U.S.C. §103(c), Kii does not preclude the patentability of the present invention because Kii is owned by the assignee of the present invention, Kyocera Corporation. 35 U.S.C. § 103(c) states that:

"Subject matter developed by another person,  
which qualifies as prior art only under one more  
subsections of (e), (f), and (g) of section 102 of this title,  
shall not preclude patentability under this section where

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the subject matter and the claimed invention were, at the time of the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

The Kii patent is and was assigned to Kyocera Corp. The assignment is recorded with the U.S. Patent and Trademark Office at reel/frame 011088/0050. The instant Application is also assigned to Kyocera Corp. The assignment is recorded with the U.S. Patent and Trademark Office at reel/frame 012334/0022.

Based on the foregoing, Applicants believe that Kii can only be prior art under 102(e), 102(f) or 102(g). Pursuant to MPEP 706.02(l)(2), Applicants believe that Kii does not preclude the patentability of the present invention. Applicants file concurrently herewith a statement concerning common ownership. Withdrawal of these rejections is thus respectfully requested.

Claims 9, 10, 14, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tanizaki et al. (U.S. Patent No. 5,982,255) in view of Fujimaru et al. (U.S. Patent No. 5,246,898) in view of Kii et al. (U.S. Patent No. 6,437,663). Applicant respectfully traverses these rejections.

Claims 9, 10, 14, and 15 depend from claim 4, and as such are patentable over Tanizaki and Fujimara for at least the same reasons as discussed above. Kii cannot remedy the defect of Tanizaki and Fujimaru, for reasons discussed above. Withdrawal of these rejections is thus respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6810 to discuss the steps necessary for placing the application in condition for allowance.

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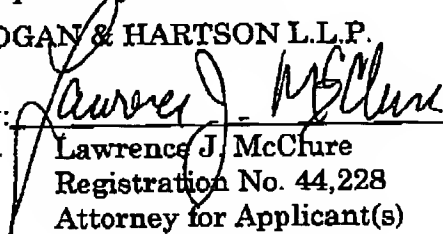
If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,

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